Coastal Engineering Technical Note

BANK EROSION CONTROL WITH PACIFIC CORDGRASS ON THE SOUTHERN PACIFIC COAST (HUMBOLDT BAY TO MEXICO)

PROBLEM: Pacific cordgrass (*Spartina foliosa*)(Figure 1)has been shown to be useful for reducing erosion on sheltered and low wave energy shorelines. However, a method is needed for determining site suitability and for identifying appropriate plant materials and planting methods on a case by case basis.

APPROACH: A potential site can be evaluated using Figure 2 - Vegetative Stabilization Site Evaluation Form. This Form helps the user to determine whether or not the site is suitable for stabilizing with Pacific cordgrass (the primary plant used for bank stabilization in this region).

Step One - Site Suitability: Consider each of the shore variables in Figure 2. Select the descriptive category for each variable which best describes the site. Place the numerical score assigned to the appropriate descriptive category in the right-hand column. Total the column to determine the cumulative wave climate score. Sites which score from 0 to 30 are suitable for vegetative stabilization with Pacific cordgrass.

Figure 1 - Pacific Cordgrass

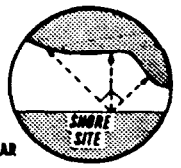
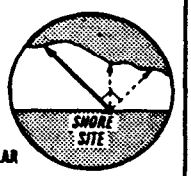
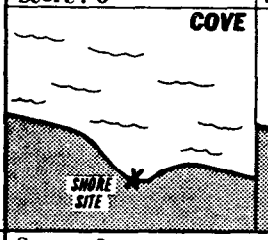
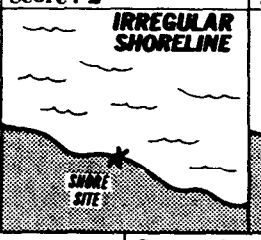
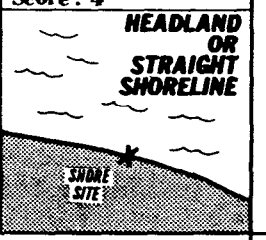
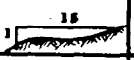
1. SHORE VARIABLES	2. DESCRIPTIVE CATEGORIES (SCORE AS INDICATED)						3. SCORE
a. FETCH - AVERAGE AVERAGE DISTANCE IN KILOMETERS (MILES) OF OPEN WATER MEASURED PERPENDICULAR TO THE SHORE AND 45° EITHER SIDE OF PERPENDICULAR 	Score : 0	Score : 2	Score : 4	Score : 6	Score : 8	Score : 10	
	LESS THAN 3.0 (1.8)	3.1 (1.9) to 6.0 (3.7)	6.1 (3.8) to 9.0 (5.6)	9.1 (5.7) to 12.0 (7.5)	12.1 (7.6) to 15.0 (9.4)	GREATER THAN 15.0 (9.4)	
b. FETCH - LONGEST LONGEST DISTANCE IN KILOMETERS (MILES) OF OPEN WATER MEASURED PERPENDICULAR TO THE SHORE OR 45° EITHER SIDE OF PERPENDICULAR 	Score : 0	Score : 2	Score : 4	Score : 6	Score : 8	Score : 10	
	LESS THAN 4.0 (2.5)	4.1 (2.6) to 8.0 (5.0)	8.1 (5.1) to 12.0 (7.5)	12.1 (7.6) to 16.0 (10.0)	16.1 (10.1) to 20.0 (12.6)	THAN GREATER 20.0 (12.6)	
c. SHORELINE GEOMETRY GENERAL SHAPE OF THE SHORELINE AT THE POINT OF INTEREST PLUS 200 METERS (660 FT) ON EITHER SIDE	Score : 0		Score : 2		Score : 4		
							
d. SHORE SLOPE SLOPE OF THE PLANTING AREA (VERTICAL TO HORIZONTAL) 	Score : 0			Score : 4			
	GRADUAL 1 to 15 OR LESS			STEEP MORE THAN 1 to 15			
e. SEDIMENT GRAIN SIZE OF SEDIMENTS	Score : 0	Score : 2	Score : 4	Score : 6	Score : 8		
	SILT & CLAY	FINE SAND	MEDIUM SAND	COARSE SAND	GRAVEL		
f. BOAT TRAFFIC PROXIMITY OF SITE TO NAVIGATION CHANNELS FOR LARGE VESSELS OR SMALL RECREATIONAL CRAFT	Score : 0		Score : 8		Score : 16		
	NO NAVIGATION CHANNEL WITHIN 1 KILOMETER (0.6 MILES)		NAVIGATION CHANNEL WITHIN 1 KILOMETER (0.6 MILES)		NAVIGATION CHANNEL WITHIN 100 METERS (330 FT)		
g. WIND THE ORIENTATION OF THE SITE IN RELATION TO LOCAL WINDS	Score : 0		Score : 4		Score : 8		
	SHELTERED FROM WIND		DOES NOT FACE IN THE DIRECTION OF PREVAILING WINDS OR FREQUENT STORM WINDS		FACES IN THE DIRECTION OF PREVAILING WINDS OR FREQUENT STORM WINDS		
4. CUMULATIVE WAVE CLIMATE SCORE ____							

Figure 2. Vegetative Stabilization Site Evaluation Form

Step Two - Planting Specifications for Pacific Cordgrass: The following planting specifications are keyed to the cumulative wave climate score, determined in step one.

TABLE - Planting Guide

Specification \ Evaluation Score	1-10	11-20	21-30
Planting Techniques:	Sprigs	Sprigs or 15 week seedlings	5-7 month seedlings or plugs
Plant Spacing:	0.5 meters	0.5 meters	0.5 meters
Minimum Width of Planting Zone:	3.0 meters	3.0 meters	6.0 meters

Optimal Salinity Range: 10 to 35 parts per thousand.

Planting Zones: Mean tide to mean high water.

Optimal Planting Time: March, April, and May

Fertilization: 30 to 50 kilograms per hectare 2 to 4 weeks after planting (consisting of equal parts of nitrogen and phosphate).

ADDITIONAL INFORMATION: For further information contact E. J. Pullen (WESER-C) (601) 634-3650

KNUTSON, P.L., "Planting Guidelines for Marsh Development and Bank Stabilization," CETA 77-3, U.S. Army, Corps of Engineers, Coastal Engineering Research Center, Fort Belvoir, VA, August 1977.

WOODHOUSE, W.W., "Building Salt Marshes Along the Coasts of the Continental United States," SR-4, U.S. Army, Corps of Engineers, Coastal Engineering Research Center, Fort Belvoir, VA, May 1979.

NEWCOMBE, C.L., MORRIS, J.H., KNUTSON, P.L., and GORBICS, C.S., "Bank Erosion Control With Vegetation, San Francisco Bay, California," MR 79-2, U.S. Army, Corps of Engineers, Coastal Engineering Research Center, Fort Belvoir, VA, May 1979.